

HP_ID / COTE TOP 10 MEASURES

Block D Makers Quarter

SAN DIEGO, CALIFORNIA

bnim

*COTE Top Ten is the industry's best-known awards program for sustainable design excellence. Each year, ten innovative projects are recognized for their integration of design excellence with environmental performance. COTE Top Ten Awards highlight the highest achievements in both design intent and actual performance across the triple bottom line of social, economic, and environmental value.



Our work recognizes the opportunity for elevating human experiences within the intersections of high performance environments and interdisciplinary building design.

The Makers Quarter is a landmark project in helping our clients realize **transformative, healthy, flexible** environments for entrepreneurs and artists to create and innovate, while fostering a culture of community and synergy that extends beyond the building walls. At BNIM we refer to our process as **Human Purposed Integrated Design** (HP.ID) and we embrace the opportunity to elevate human and organizational potential and building performance through mindful design.

HP.ID elevates the way we realize each project to achieve outcomes of efficiency, comfort, and durability. Achieving results for occupants requires challenging conventions and traditional practices of program, design, and construction.

Our process is collaborative and iterative. We collaborate with our clients to create solutions that achieve their goals for increased performance without additional expense. We have found that by crafting better envelopes, harvesting daylighting more effectively, accurately understanding electrical loads, and being smarter about ventilation we are able to allocate the budget to make buildings that are better connected to their environs and less dependent upon mechanical and electrical systems. In doing so, we shift dollars from things that use energy to things that save energy, while creating more comfortable and productive results.

This book uses the AIA's Top Ten Committee on the Environment* (COTE) award's ten measures as a framework to illustrate how HP.id was achieved in the Makers Quarter Block D Building.

MEASURE 1

DESIGN FOR INTEGRATION

Area - 53,325 SF gross floor area
Project Type - New Construction, Workplace + Retail
Completion - July 2018
Pursuing LEED Platinum

As part of Makers Quarter—a new arts, culture, and innovation district in downtown San Diego’s East Village—Block D has been designed to upend workplace conventions and establish high benchmarks for future development within the district. Providing more than 50,000 SF of office and retail space, Block D evolves current notions about the workplace. The building redefines the workplace as a healthy, flexible environment for entrepreneurs and artists to create and innovate, while fostering a culture of community and synergy that extends beyond the building walls. A landmark project, Block D aims to be the first commercial office building in downtown San Diego to achieve Net Zero Energy and LEED Platinum certification. As the first office project within the five-block Makers Quarter development, Block D will serve as proof of concept for the remaining four blocks.

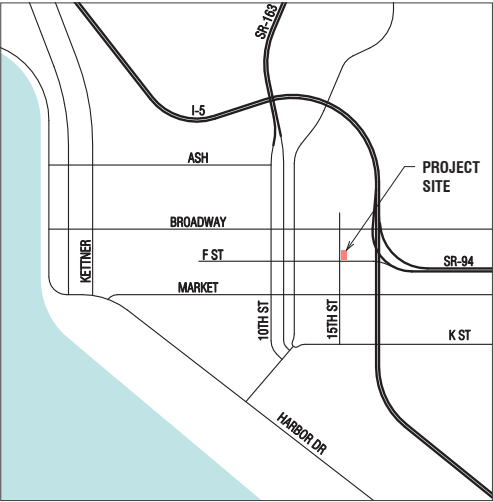
With retail and restaurant suites on the ground floor, the building has been designed for street

level activation and to encourage interaction from the surrounding community. Highly flexible office suites utilize natural ventilation through the use of motorized windows and garage doors on each level. An exposed concrete frame integrates with the natural ventilation systems to utilize a night purge of thermal mass for passive cooling during the day. A high-performance facade utilizes two active shading systems that enhance daylighting and enable users to customize daylighting levels within individual tenant spaces.

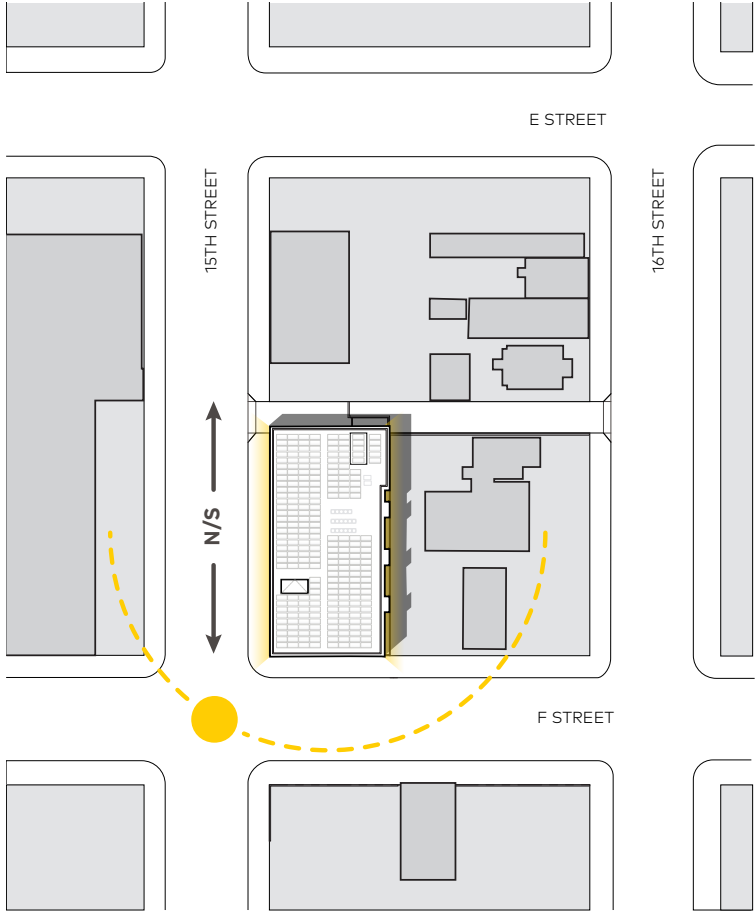
Drawing from the creative context in and around Makers Quarter, Block D has been designed to attract entrepreneurs, technology companies, start-ups, and artists as future tenants. Opening to its context, the building’s design prompts these occupants to interact and share their process with the neighborhood. Public spaces feature exposed vertical circulation systems, collaborative balcony spaces, and an open entry courtyard.

bnim is building positive

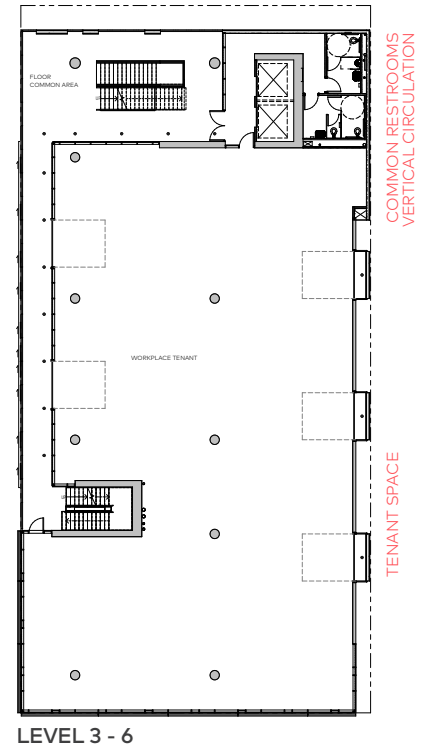
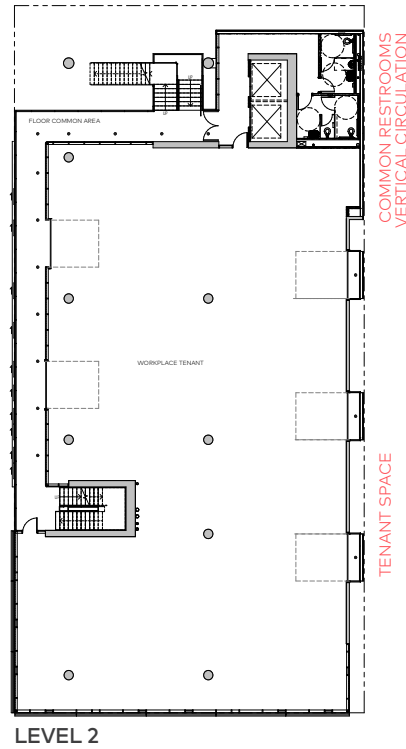
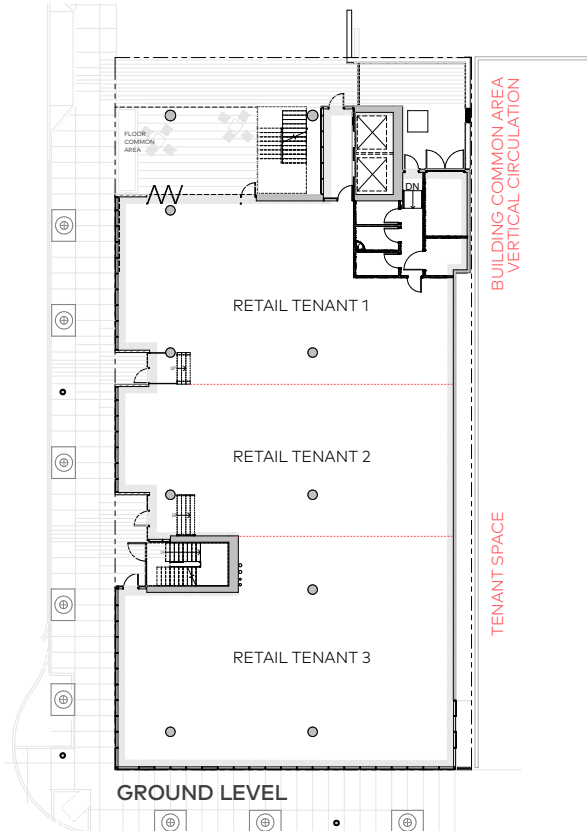




LOCATION PLAN
DOWNTOWN SAN DIEGO




SITE PLAN



MEASURE 2

DESIGN FOR COMMUNITY

Block D is the product of a tactical urbanist approach to development. Surrounded by some of the city's most diverse and culturally rich neighborhoods, the project embraces the fabric of the East Village. From the area's legacy of furniture building and auto repair, to modern co-working spaces and digital fabrication labs, Block D builds upon the neighborhood's maker spirit.

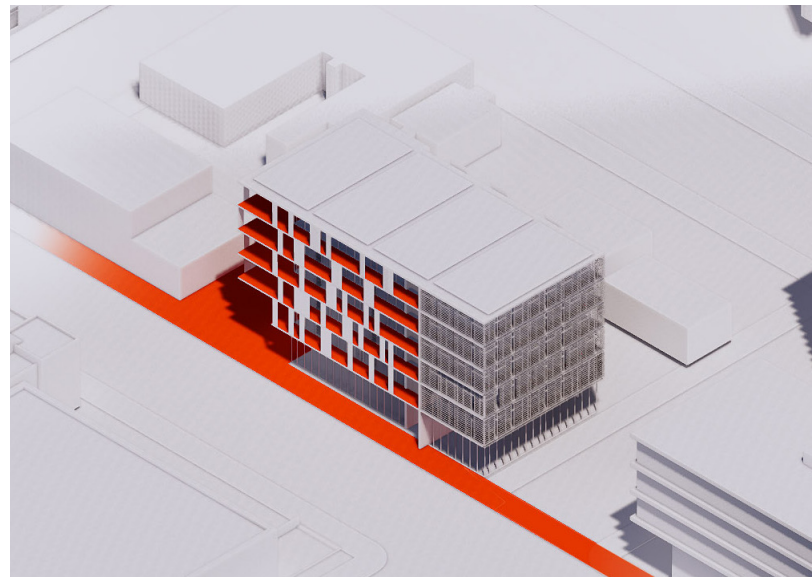
The community engagement process brought together local artists, businesses, and residents to build an identity for Makers Quarter. This community effort was grounded in the re-appropriation of public spaces and abandoned lots that gave way to the idea of an office building as an extroverted development.

Reflecting this community process, Block D was designed as a collaborative and kinetic office hub, promoting spontaneous and chance interactions by way of open circulation systems, courtyard, and elevated collaborative balconies. The spaces encourage human connection and cross pollination of ideas, effectively advancing social equity of occupants and community.

Block D provides no on-site parking, reflecting the neighborhood's culture of walkability and taking advantage of the site's close proximity to public transit. The project has a WalkScore rating of 93 (Walker's paradise), a Transit Score of 79 (Excellent), and a Bike Score of 59 (Bikeable).



Collaborative Balconies + Elevated Floor - The building design promotes serendipity interactions in how the open circulation systems, courtyard, elevated collaborative balconies all contribute the social equity of the occupants and the community which engages with this site. The opened covered walkways act as elevated streets which engage the occupants with the street edge and the urban public realm below.



MEASURE 3

DESIGN FOR ECOLOGY

Located on an urban site with tight setbacks, Block D introduces several ecologically impactful systems to capture and treat stormwater on the site. A modular wetland under an exterior egress stair treats stormwater collected from the roof. This system is visible to building occupants who utilize the stair, providing an opportunity to educate users about the site's sustainable features. Another site element, which is unique to the downtown area, is the use of a custom curb expansion. This element enables a traffic-calming strategy while also providing additional permeable surface to accommodate a biofiltration planter, which treats stormwater collected from the street.

The landscape planting palette uses adaptive plants to reduce water requirements once established. Several linear planting beds define the building edge and sidewalk while enhancing occupant views out to the planted beds and street trees beyond.

The building is designed to remove barriers to the outdoors. Passive design strategies open the building to natural ventilation and daylight. Open circulation systems create traffic patterns that weave inside and out as users navigate the building. The building site takes advantage of views out to the bay, mountains, and surrounding parks, all of which engage with the local ecology.





MEASURE 4

DESIGN FOR WATER

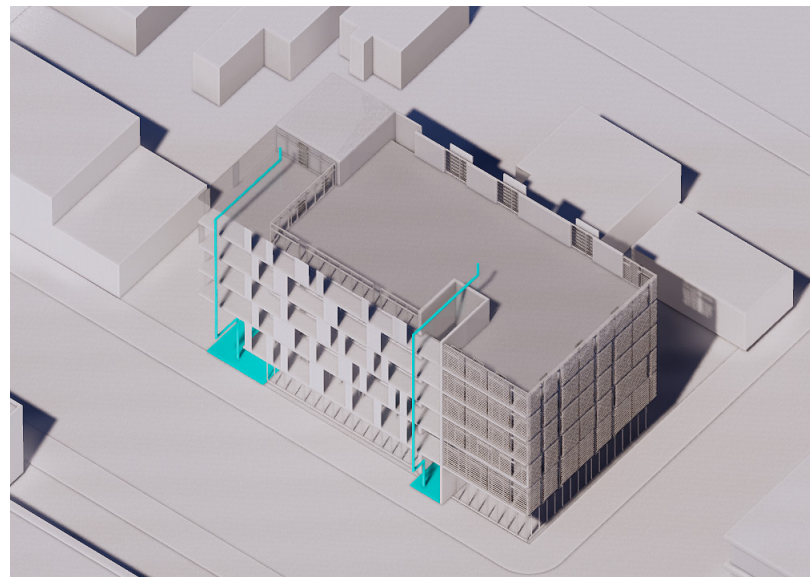
The site integrates stormwater management strategies to reduce potable water use and eliminate runoff to improve San Diego's delicate watershed and coastline. The project treats 100% of stormwater on site by way of a modular wetland adjacent to the building and a biofiltration planter adjacent to the street.

Landscape design utilized native and adaptive plant materials to reduce the amount of irrigation requirements after the plants are established on site, resulting in an anticipated 71% reduction in water consumption for landscaping. Rainfall limitations and local regulations to discharge stormwater within 48 hours without additional treatment presented challenges to on-site stormwater storage; however, for long-term flexibility, the irrigation system is plumbed with purple pipe to connect to the city's greywater source.

The interior of the building reduces the use of potable water by way of low-flow fixtures and waterless urinals. Additionally, mechanical system selection was based on water-use performance. These combined strategies reduce indoor potable water use by 38% per baseline LEED.



Modular Wetland - Without natural wetlands our cities are deprived of water purification, flood control, and land stability. A compact modular wetland system re-establishes nature's presence and rejuvenate water ways in urban areas. A pre-treatment filter chamber removes trash, sediments and hydrocarbons before it enters the biofiltration chamber improves performance and maintenance costs. A modular wetland is located under one of the exterior egress stairs to treat stormwater collected from the roof area. This system is visible to the building occupants utilizing the stair to also provide opportunities to educate its users on the sustainable features developed for this site.



38%

reduction in potable water
(baselines LEED 2009)

98%

rainwater that can be
managed on site

MEASURE 5

DESIGN FOR ECONOMY

Life cycle cost models for Block D informed several key design decisions. For mechanical system selection, the team studied traditional package units, VAV, split systems, radiant systems and VRF options. Ultimately, the VRF yielded the greatest economical values: high-performance system, flexibility for a multi-tenant building, and greater rentable area gained from the lack of required shaft space.

The mechanically operated façade shade system was discussed initially as a potential VE option since it was a non-traditional system; however, models revealed that the cost of providing additional mechanical system capacity to handle the additional solar heat gain was a higher initial first cost than to install the mechanically operated façade shade.

Analysis of the building's structural system revealed that the flat-slab-with-shear-walls structure allowed lower floor-to-floor heights, which reduced cost and materials. Utilizing the structural shear as exterior finish also reduced the façade cost for the project, enabling a budget shift that added value to the project in other areas, such as the selection of durable materials for the project that reduce maintenance and ongoing operation cost.

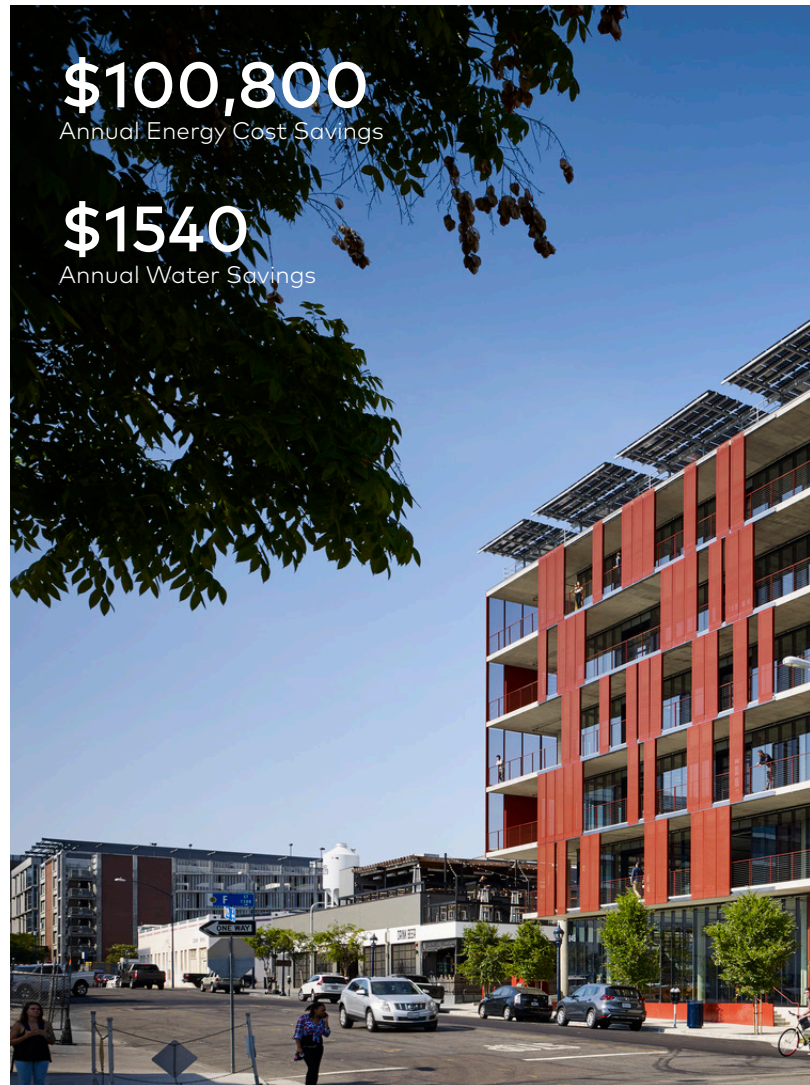
Due to design efficiencies to maximize rentable area, the building's design enables a 98% leasable floor plate.

\$100,800

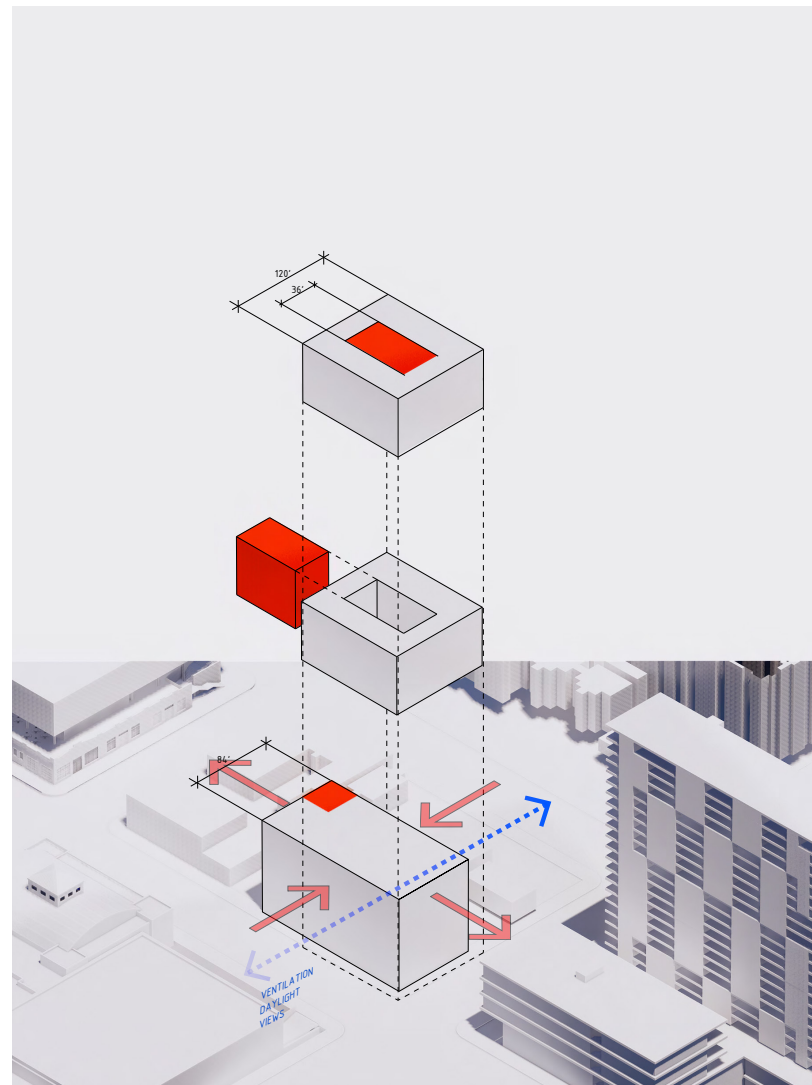
Annual Energy Cost Savings

\$1540

Annual Water Savings



The design took advantage of the optimal climate by shifting as much program space to the exterior and being non-conditioned space to reduce the cost for these areas. The shallower building core which is enclosed is non-conditioned and utilizes operable windows and exhaust fans to circulate air from the exterior.



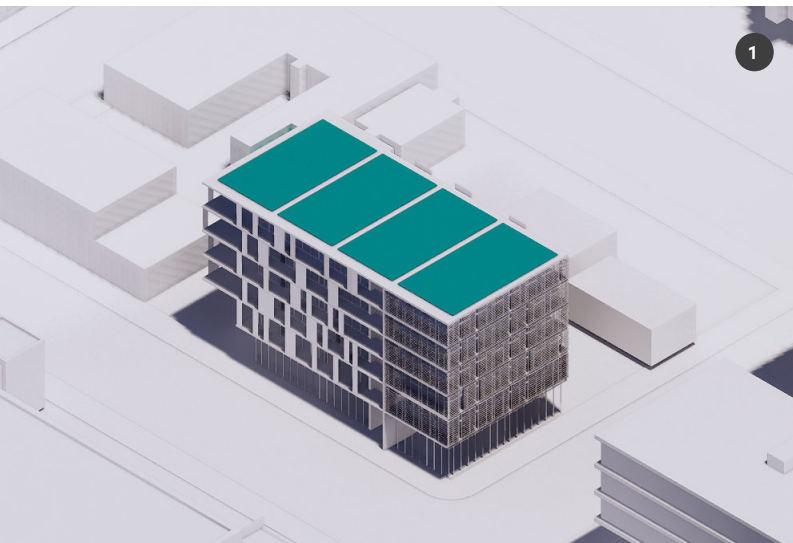
MEASURE 6

DESIGN FOR ENERGY

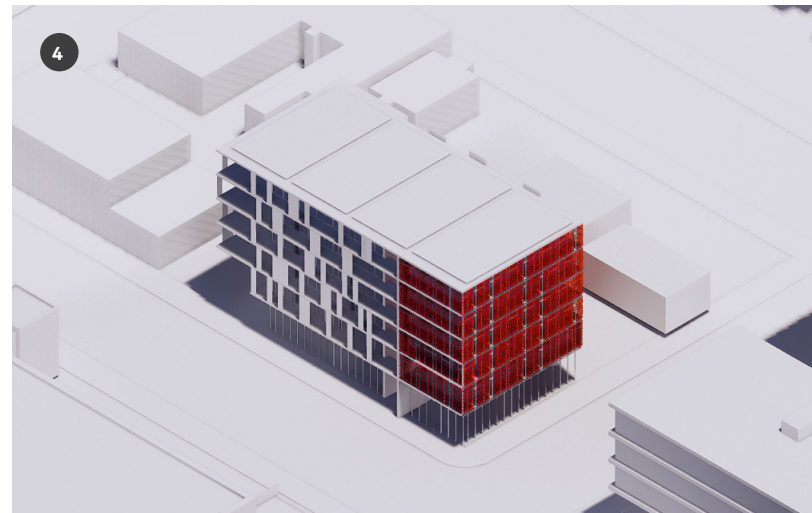
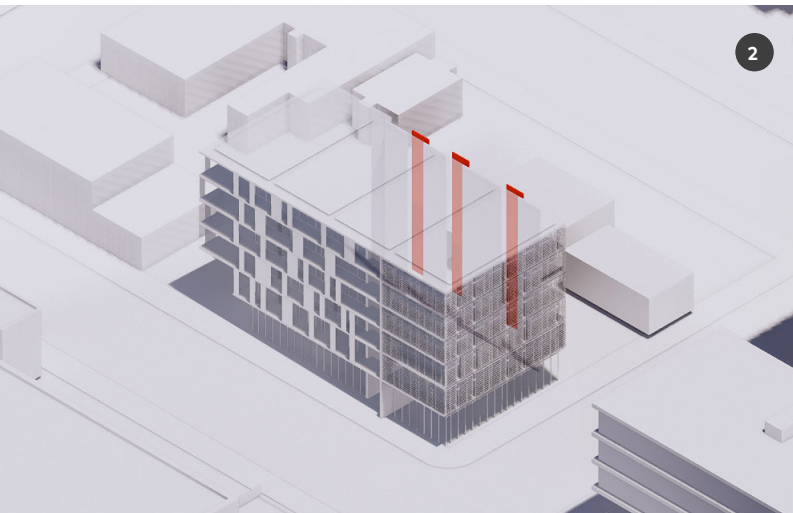
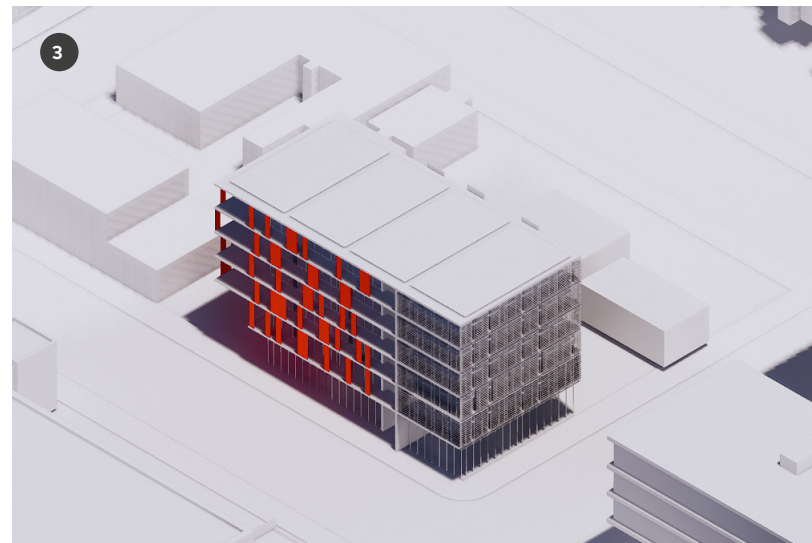
This project began with a goal of achieving Net Zero Energy and LEED Platinum certification. Energy simulations—including demand control ventilation, natural ventilation, night purging, daylighting, and climate studies—strongly informed the design process and the sustainable design strategies that were ultimately integrated into the building design. Although a great many strategies attribute to energy savings over the baseline model, a few stand out:

- High-performance envelope
- Fenestration designed to allow natural daylight into all occupied space
- Thermal mass together with night purging designed to keep the building cool and eliminate peak loads
- Smart environmental adaptive shading system, allowing the building to outperform the baseline energy goal by 66%
- High-efficiency VRF HVAC system
- Efficient lighting design, including LED fixtures, occupancy sensors, and daylighting sensors
- Demand control ventilation (DCV) in the offices and restaurant, which modulate outdoor air flow rate based on occupancy
- Building orientation designed to maximize daylighting and passive ventilation
- High efficiency ceiling fans, allowing an increase in comfort air temperature by 6°F and a reduction in the number of operation hours of the air conditioning system
- Photovoltaic panels covering the entire roof area
- Natural Ventilation System, enabling passive cooling
- Building dashboard, providing building performance metrics

- 1. Photovoltaic Panels** - PV panels on the roof use solar energy to generate electricity which would serve the office tenants in achieving the zero net energy goals of the project and in creating a new benchmark in the commercial office market.
- 2. Light Wells** - The east light wells also serve a dual purpose. They bring in natural daylight and facilitate cross-ventilation, but tenants can also use them as private balconies. These balconies were created as a result of optimizing the light wells.



- 3. Manually Operated Sunshades and** - A smart environmental adaptive shading system is designed to further maximize the energy savings. Manually operated sun-shades cover approximately 60% of the exposed west glazing along the exterior walkway and can be arranged by the users to provide shading where it best suits them.
- 4. Mechanically-Operated Sunshades** - Operable and perforated shading minimize direct solar radiation while allowing daylight into the building. These panels allow the building to outperform the baseline energy goal by 66%.



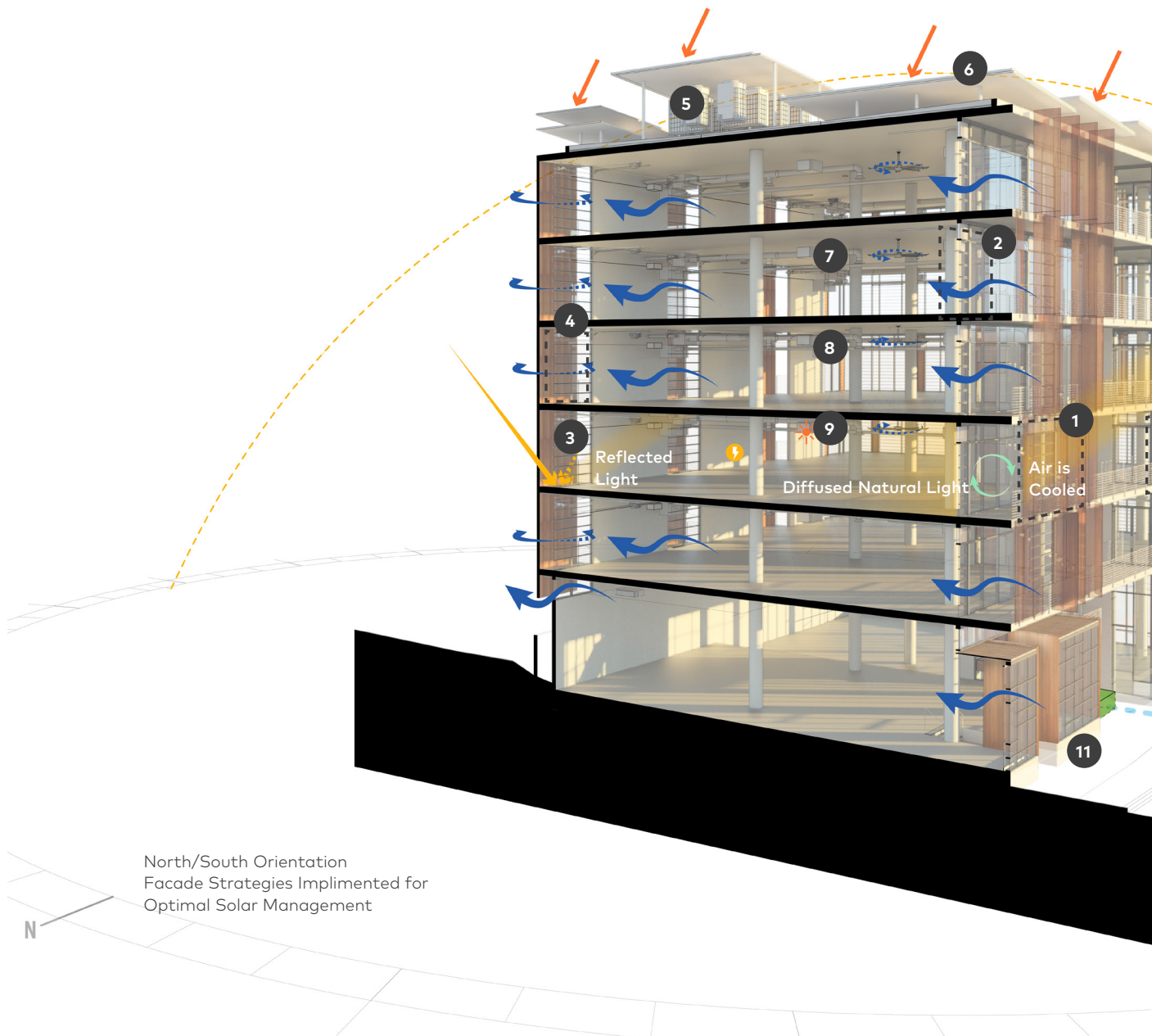
72%

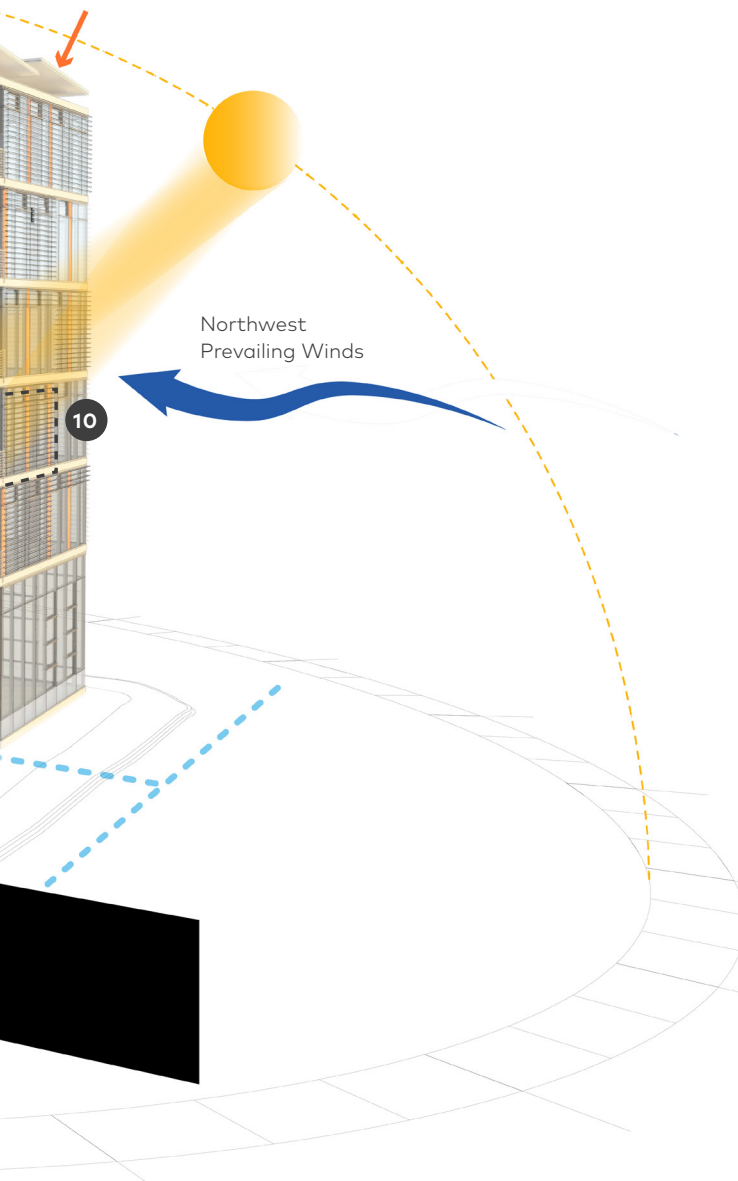
Predicted reduction from
national average EUI for
building type

4





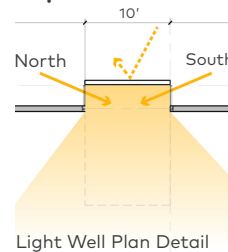




- ⚡ 1 Folding Manual Operable Vertical Sun Shades
 - The operability allows optimal management of east solar heat gain and direct sunlight year round
 - Exterior walkway cools air before entering the building

- 🌬️ ⚡ 🌿 2 Overhead Sectional Garage Doors Cross Ventilation

- ⚡ 🌿 3 Daylight Harvesting Light Wells
 - Blocks east light and harvests light from the north and south.
 - Sealed concrete floor reflects light deep into the space



- 🌬️ ⚡ 🌿 4 Overhead Sectional Garage Doors Natural Ventilation

- ⚡ 5 VRF Mechanical System

- ⚡ 6 Photovoltaic Panels

- ⚡ 🌿 7 Motion/Daylight Sensors

- 🌬️ ⚡ 🌿 8 Fans help circulate air circulation

- ⚡ 🌿 9 Concrete thermal mass stores and purges heat

- ⚡ 10 Automated Operable Sunshades - west and south solar management

- 💧 11 Modular wetland for stormwater

- ⚡ Energy
- 🌬️ Indoor Air Quality
- 💧 Water
- 🌿 Human Wellbeing

MEASURE 7

DESIGN FOR WELLNESS

Block D is a product of research seeking to understand the relationship between human health and time spent in nature. Located in San Diego's mild climate—an intersection of perennial sunlight and ocean breezes—the building provides immersive access to nature by embracing daylight, ventilation, and views.

The building design employs active façade elements that adapt to a wide range of potential tenants' personal comfort levels while optimizing energy performance based on real-time environmental conditions. A motorized shading system protects the glazing and optimizes solar performance. Glass garage doors and operable windows enable natural cross-ventilation on each level. Thermal mass from the exposed concrete structural frame regulates indoor temperatures. Smart shading systems provide adaptable protection to adjust to seasonal sun angles and offer users the ability to control the amount of daylight allowed into their space.

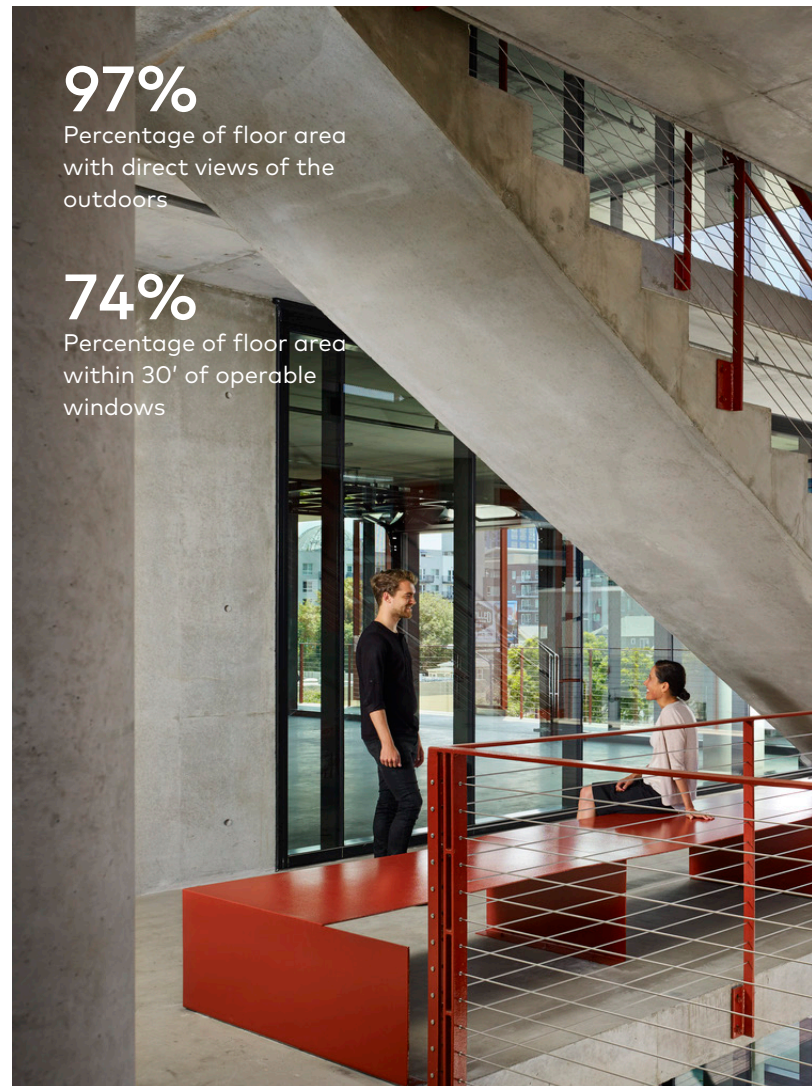
The east light wells serve a dual purpose, bringing in natural daylight and facilitating cross-ventilation while also serving as private balconies. Public spaces are designed to promote interaction by way of exposed vertical circulation systems, collaborative balcony spaces, and an open entry courtyard. This strategy extends the walkability of the surrounding neighborhood vertically through the building promoting health and wellness to its occupants.

97%

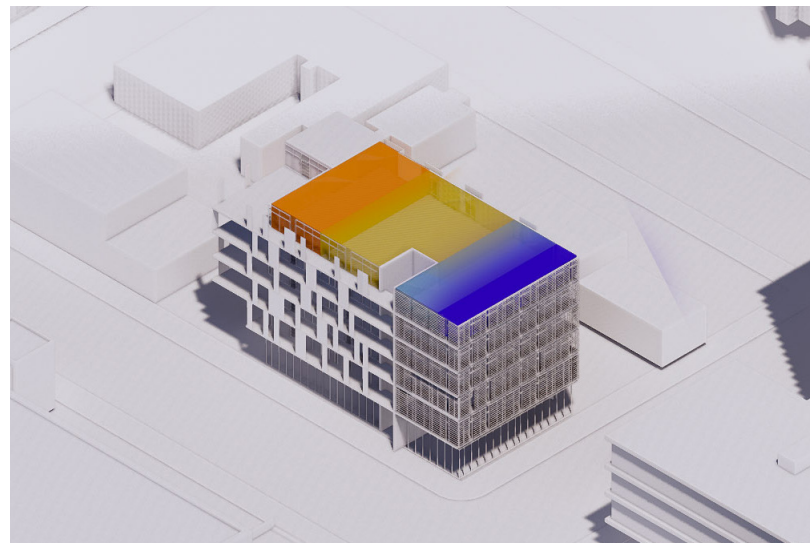
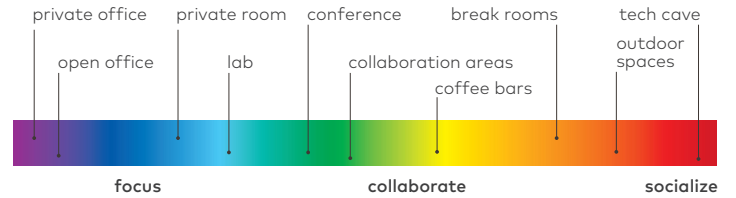
Percentage of floor area with direct views of the outdoors

74%

Percentage of floor area within 30' of operable windows



Spectrum of Places to Work - The flow and dynamic of the workplace has been shifting for quite some time, but it is even more recognizable now that technology and changing demographics have transformed the workplace into a collaborative organism. Communication flows in multiple directions vs. from the top down; pools of knowledge in an organization are interconnected. Despite this shift into more interactive environments, places for focused work are still needed. The design of each floor is guided by the spectrum to designate places of focus, collaboration and social interaction.



MEASURE 8

DESIGN FOR RESOURCES

In developing an innovative market rate development, the team challenged traditional material and systems assumptions about this building typology to push cost efficiency for the project. As a goal, every building material had to provide multiple functions and be highly durable to minimize operational cost in the future. The design focused on a minimal approach to detailing the structural and mechanical systems as finish, thus reducing material use and associated cost to cover those systems.

The team utilized local manufacturing for all the façade components, apart from the motorized sunshade system, to reduce transportation and promote local jobs. By establishing a direct collaborative workshop process between the design team and glazing subcontractors, metal panel manufacturer, and concrete contractors, the team minimized materials and processes for installation and refined the detailing for cost efficiency throughout the process.

The project was designed on a 40" module to promote efficiency with material systems and provide future flexibility as the building is modified over time. The metal panels and sliding screens are all composed of recycled aluminum with Kynar finish, providing a highly durable material that can be recycled in the future.



MEASURE 9

DESIGN FOR CHANGE

A design imperative for Block D focused on future flexibility and a long-life, loose-fit approach. The massing organization allows for flexible floor plates, which can be subdivided into multiple tenant floors, single tenant use, or even converted to research space, housing units, or fabrication studios. The utility core at the north end of the building allow open floor spatial configurations to change over time to suit user needs. The structural design, which utilized mild reinforced flat slabs, allows for flexibility in core drilling future utilities throughout the floor area to adapt the existing building for future uses and system requirements. Additional refrigerant piping line sets installed vertically in the building provide flexibility to convert floors in the future to higher energy intensive uses, such as computational research spaces with large data servers.

The PV system was designed to accommodate a future battery storage as part of the system. This feature would, during normal operations, cut down on the peak demand loads and would provide resiliency in the future if the power grid was unavailable for a period of time.

Basic Agency - Workplace Tenant at Block D



42%

Percentage of power
needs supported by
onsite power generation



MEASURE 10

DESIGN FOR DISCOVERY

Opened in late 2018, the building is attracting tenants interested in workplaces that present significant energy cost savings and support human wellness. The building's first tenant sought a workspace that would help their organization grow. Block D aligned strongly with their corporate values, offering them a unique, healthy workplace environment that could work as an asset for their business, increasing staff creativity, innovation, productivity, health, and well-being, and serving as a tool to attract the type of talent needed to grow their business.

The project's unique strategies, metrics, and approaches, along with the many lessons learned (cost metrics, urban design strategies, and high-performance options) present an opportunity to positively influence other developments locally, regionally, and nationally. As a start, between June 2017 and December 2018, the design team has presented the building's design and metrics at five conferences locally in San Diego.

With building occupancy taking place over the next six months, the team will also study and confirm design assumptions related to social connections and passive design features. The collection of this data will impact the design team's work at a national scale and will continue to be shared with the broader design community.



Basic Agency - Workplace Tenant at Block D



AWARDS

2018 CITATION, EXCELLENCE IN DESIGN AWARDS

AIA San Diego

2018 MERIT, ARCHITECTURE LARGE, EXCELLENCE IN DESIGN AWARDS

AIA Kansas City

2018 HONOR, EXCELLENCE IN DESIGN AWARDS

AIA Kansas

2018 MERIT, EXCELLENCE IN DESIGN AWARDS

AIA Iowa

2018 CITATION, EXCELLENCE IN DESIGN AWARDS

AIA Central States Region

"BNIM takes a very site specific approach in their planning efforts, and in doing so allows for community engagement, through tactical urbanism, to be embedded and integrated into the value system of their design strategy. We've been most impressed with their genuine excellence and holistic approach to sustainability and urban density as it relates to the design of the office space within Makers Quarter. By intertwining public realm and open space, they've helped us to create an environment that appeals most competitively to prospective tenants and our ethos of future workplace."

STACEY PENNINGTON, MAKERS QUARTER CLIENT, PRINCIPAL/FOUNDER OF SLP URBAN PLANNING

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